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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER				
MONDT, JOHANNES P				
ART UNIT		PAPER NUMBER		
3663				
NOTIFICATION DATE		DELIVERY MODE		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/733,282

Applicant(s)

LE TOURNEUR, PHILIPPE

Examiner

JOHANNES MONDT

Art Unit

3663

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 June 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 10-13, 16 and 18-21 is/are pending in the application.
- 4a) Of the above claim(s) 3, 4, 6 and 7 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 5, 8, 10-13, 16 and 18-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. With reference to Miscellaneous Action mailed 06/04/2009 and Examiner Interview Summary mailed 06/04/2009, finality of the Office action mailed 12/01/2008 has been withdrawn and After-Final Amendment filed 05/01/2009 is accordingly considered as an Amendment under 37 C.F.R. 1.111(a), forming the basis for the following Office action.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. **Claims 1, 2 and 5** are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al (JP 63-037621, English abstract) in view of Watt et al (WO 98/20517).

Yamada et al teach a target *capable* to emit neutrons when bombarded with particles, comprising:

neutron emissive parts 5 (boron nitride hydride) and neutron non-emissive parts 4 (gold) (see English abstract, "Purpose", lines 1-4; and "Constitution", lines 6-10) which are juxtaposed, only the neutron emissive parts emitting neutrons during bombardment with particles (inherently so, through the hydrides: see admission by applicant in the specification in this regard), said emissive and non-emissive parts

being arranged so as to form a non-uniform pattern as a coded mask (as they form a coded mask (see English abstract, "Purpose", lines 1-4 and title).

When bombarded with particles capable of causing fusion reactions in hydrogen isotopes said target necessarily emits neutrons, yielding a neutron flow including plural neutron beams coded by the pattern of the mask (each beam caused by an area of hydride). However, applicant is reminded that the limitations "intended to emit neutrons when bombarded with particles" (lines 1-2) and "such that said target emits a neutron flow including plural neutron beams coded by the pattern of the mask" limit intended use only, and have zero patentable weight for the claimed target. Intended use and other types of functional language must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto, 136 USPQ 458, 459 (CCPA 1963).

Yamada et al do not teach the limitation that said neutron-emissive parts contain anthropogenic tritium. *However, it would have been obvious to include said limitation in view of Watt et al*, who, in a patent document on imparting geometrically complicated structures on a surface (see "Abstract", "Field of the Invention", "Background of the Invention" and "Description of the Embodiments of the Invention", especially col. 5, l. 35-50), hence analogous art with regard to the problem to be solved in a manufacturing process of the coded mask by Yamada et al, namely: how to impart a coded pattern on a surface, teach the penetration of a tritium beam (a tritium beam inherently being man-

made, i.e., anthropogenic) in regions of the surface that form a specified pattern in a resist 1 on said surface (see first two paragraphs of "Description of the Embodiments of the Invention", page 5), creating exposed areas 3 in said resist 1, followed by deposition of a different material in the exposed areas to form microstructures 7 in the metallized substrate with the resist removed (see "Brief Description of the Drawings", pages 4-5). It would have been obvious to include the teaching by Watt et al of the method of better defining the geometrically complicated and small areas in which a different material needs to be deposited also in the invention by Yamada et al because both Watt et al and Yamada et al are concerned with improving the accuracy with which the complicated pattern can be defined (see Yamada et al, English abstract, "Purpose"). In the combined invention some of the tritium unavoidably remains in outside but in the periphery of the exposed area, while the step of electroplating is common among Yamada et al (loc.cit.: "gold plating") and Watt et al ("electroplating" in Watt et al results in electroplated metal 6 and, after polishing/grinding and removal of the remaining resist: microstructures 7: see "Brief Description of the Drawings", especially for Figures 3b and 3c, on pages 4-5). The formation of a layer 5 of the material embodiment as taught by Yamada et al rather than the metal layer 4 of Watt et al is trivial in that only the substitution of a layer of said material embodiment instead of metal layer 4 is required. Therefore, the combination has reasonable expectation of success.

On claim 2: the emissive parts in Yamada et al are formed from at least one metal hydride, namely a hydride of the metal boron (N.B.: see Merriam-Webster's Collegiate Dictionary on boron; page 133), the metal of the metal hydride being located on a

support in non-hydrogen fixing material (gold). Whether or not said metal hydride was deposited is of zero patentable weight for the claimed target, being merely a product-by-process limitation. The limitation is only of patentable weight in as much as the method steps distinguish the final structure, and to the extent not impacting final structure are taken to be product-by-process limitations and non-limiting.

A product by process limitation is directed to the product per se, no matter how they are actually made. See *In re Fessman*, 180 USPQ 324, 326 (CCPA 1974); *In re Marosi et al*, 218 USPQ 289, 292 (Fed. Cir. 1983), and *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985), all of which make clear that it is the patentability of the final structure of the product "gleaned" from the process steps that must be determined in a "product-by-process" claim, and not the patentability of the process. See also MPEP 2113. Moreover, an old or obvious product produced by a new method is not a patentable product, whether claimed in "product by process" claims or not.

On claim 5: the non-hydrogen material of the support is chosen from among copper, silver or gold, said metals being used alone or in combination: namely: gold (see English abstract, "Purpose").

2. . **Claim 8** is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al and Watt et al as applied to claim 1, in view of Armistead (5,838,759).
As detailed above, claim 1 is unpatentable over Yamada et al in view of Watt et al. Yamada et al do not necessarily teach the further limitation defined by claim 8. However, it would have been obvious to include said further limitation in view of Armistead, who, in a patent on an x-ray imaging system (see title and abstract, as well

as "Field of the Invention"), hence analogous art, teaches the selection of a particle accelerator 14 as X-ray source (col. 2, l. 41-47). *Motivation* to include the teaching by Armistead in the invention by Yamada et al derives from the teaching by Armistead of the relatively inexpensive and compact (hence easily transportable) nature of the linear accelerator 14 (loc.cit.).

3. **Claims 10, 12-13, 16, 18, 20 and 21** are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al, Watt et al and Armistead as applied to claim 8 above, and further in view of Cluzeau (FR 2 738 669) (as previously cited).

As detailed above, claim 8 is unpatentable over Yamada et al in view of Watt et al and Armistead. Neither necessarily teach the further limitation defined by claim 10, although Armistead does teach the inclusion of a converter plate 22 in the X-ray pathway for the generation of fast neutrons (see col. 5, l. 45-59). However, it would have been obvious to include said further limitation in view of Cluzeau, who, in a patent on a detection system using fast neutrons, hence analogous to Armistead, teaches that the particle accelerator is equipped with an alpha particle detector 15, 35 associated with the emission of neutrons (see abstract). Motivation to include the teaching by Cluzeau in this regard in the invention by Yamada et al and Armistead derives from the possibility to verify nuclear fusion reactions, hence the presence of deuterium or tritium, caused by any of the primary neutrons.

On claims 12-13: the target in Cluzeau is inclined in relation to the direction of the particles bombarding it (see abstract and Figures 1 and 2). So it is in Armistead

(target 12, beam 15, see col. 4, l. 15+ and Figures 1-2). Such inclination is at least obvious as a mode of operation that enlarges the degrees of freedom of positioning accelerator, target and detectors. Motivation derives from said degrees of freedom. The alternative of parallel target and alpha detector (as recited in claim 13) equally is motivated by said enlargement of the degrees of freedom.

On claim 16: although Armistead includes the teaching of a neutron generating means in the form of converter plate 22 rather than a neutron generating tube, the device by Cluzeau contains a neutron generating tube 21 comprising a target and is equipped with a particle detector 15/35 associated with the emission of neutrons (the alpha particles and neutrons are emitted in exactly opposite directions and through the same nuclear reaction $^3\text{H}(\text{d},\text{n})^4\text{He}$ (page 2) by conservation of linear momentum). It would have been obvious to include the teaching by Cluzeau on neutron generating tube, motivated by the creation thereby of the possibility of independent energy ranges of X-ray and neutron interrogating mean, thus increasing the degrees of freedom of the interrogation process.

On claim 18: as explained above, Cluzeau also teaches the neutron generating tube to be equipped with an alpha particle detector associated with the emission of neutrons. As explained above, *motivation* derives from the possibility to identify and both localize and time nuclear fusion events. See Cluzeau as cited to date.

On claims 20-21: the target in Cluzeau is inclined in relation to the direction of the particles bombarding it (see abstract and Figures 1 and 2). So it is in Armistead (target 12, beam 15, see col. 4, l. 15+ and Figures 1-2). Such inclination is at least obvious as a

mode of operation that enlarges the degrees of freedom of positioning accelerator, target and detectors. Motivation derives from said degrees of freedom. The alternative of parallel target and alpha detector (as recited in claim 13) equally is motivated by said enlargement of the degrees of freedom.

4. **Claims 11 and 19** is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al, Watt et al, Armistead and Cluzeau as applied to claim 10 above, and further in view of Kassing (DE 3049153 A1) (previously cited) (see also computerized translation from the EPO).

As detailed above, claims 10 and 18 are unpatentable over Yamada et al, Watt et al Armistead and Cluzeau, none of whom necessarily teach the further limitation defined by claim 11 nor the further limitation defined by claim 19. However, it would have been obvious to include said further limitation in view of Kassing, who, in a patent on alpha particle detectors, hence in this regard analogous to Cluzeau, teach the alpha particle detector to be a semiconductor storage matrix (claim 1 in Kassing) connected to an electrical circuit. The pixels by definition are the units of electrical response to the detected alpha particles. Motivation to include the teaching by Kassing derives from the efficient spatial resolution obtained in the semiconductor alpha particle detector.

Response to Arguments

2. Applicant's arguments filed 05/01/2009 have been fully considered but they are not persuasive.

- a. Applicant's first argument of traverse (pages 3-4 of Remarks) is that stencil 5' and plating base 4 are removed and that therefore the actual X-ray mask of Yamada et al does not have the boron nitride carbide hydride film 5 and thus does not have the "neutron-emissive parts" as interpreted by examiner.

Examiner disagrees because in the remainder of the specification (see English translation by the USPTO) Yamada et al disclose unequivocally that removal of neither stencil 5' nor plating base 4 is anything but optional: see Embodiment 2, wherein Yamada discloses that according to said second embodiment, plating base 4 and plating stencil 5' may be kept in the final product in a case when radiolucency is ensured. The stencil material is, in this case, a compound of boron hydride and boron-carbon nitride (hence indeed, as set forth in the previous Office action on the merits, a *boron nitride hydride*) (see page 7 of the English translation of Yamada et al) and the plating base is made of *gold* (gold-plated) (as set forth in the previous Office action on the merits) (see page 6 of the English translation of Yamada et al). The presence in this embodiment of ITO (indium-tin-oxide) plated with the gold does not introduce neutron-emissive parts because neither indium, nor tin, - both being non-light metals, nor oxygen are neutron-emissive as construed from the specification, neutron emission being due to a fusion reaction. Hence, the rejection of claims 1, 2 and 5 as unpatentable over the abstract of Yamada et al in view of Watt et al (pages 2-5 of said Office action), is not at all in contradiction with the full text of Yamada et al.

- b. Applicant's second argument on an alleged absence of "neutron-non-emissive parts" (page 4) relies on the removal of the plating base and hence is equally unpersuasive for the reason explained above under a.
- c. Applicant's third argument in traverse of the obviousness over Watts of the use of anthropogenic tritium again relies on the removal of the stencil 5' and plating base 4, and hence also fails to persuade for the same reason as explained above under "a".

For the above reasons, the claims are still deemed unpatentable over the same prior art as applied previously.

Conclusion

3. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHANNES MONDT whose telephone number is (571)272-1919. The examiner can normally be reached on 8-17.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack W. Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JOHANNES MONDT/
Primary Examiner, Art Unit 3663